

University of Bahrain
College of IT
Department of Computer Science
ITCS341 – Object-Oriented Systems
First Quiz

Students Name: _____ ID: _____

1. In a library system students can borrow, return, and purchase books. Think of possible objects for the system along with their operations.

A possible object would be **LibraryUser** (i.e. student, instructor .. etc.), list its attributes and functions related to this system and write in a form of a either Java or C++ class.

```
public class Student {  
    private String name name;  
    private int id;  
    public void borrow(String bookId);  
    public void purchase(String bookId);  
    public void return(String bookId);  
    private String book title;  
    private String book Id;  
    private String authw/Name;  
}
```

✓

10

Fill each Blank with One Word Only:

In an object-oriented system each object has its own Identity.

✓

Circle the Right Answer:

The process of reusing classes is called:

- a. Polymorphism b. Identity c. Abstraction d. Inheritance

✓

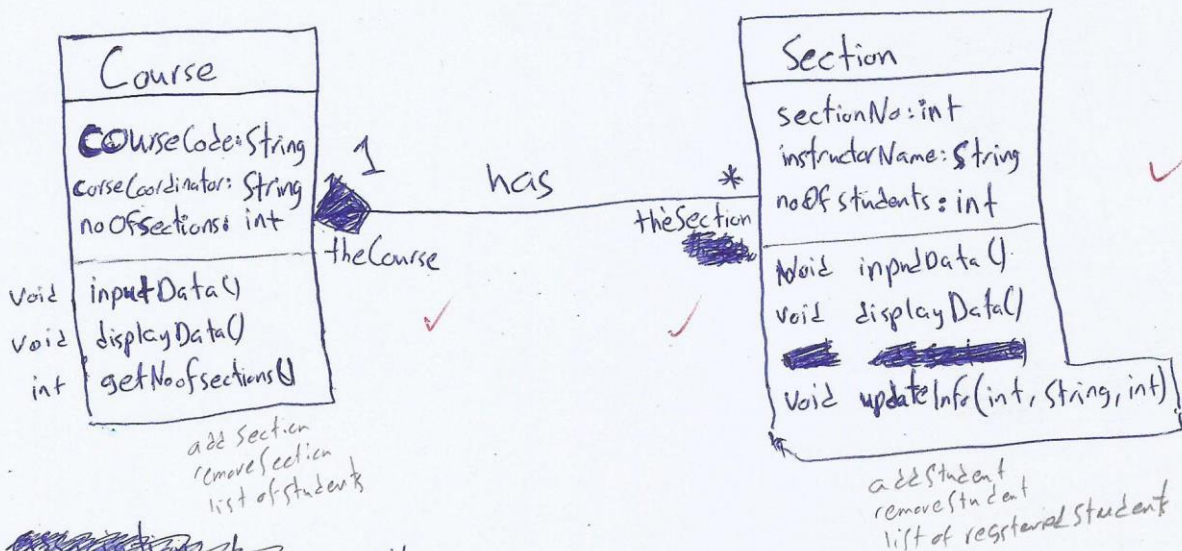
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Second Quiz

Students Name: _____

ID: _____

Consider the two main entities for a university registration system i.e. the **Course** and **Section**. Using **UML** do the following tasks:

- Develop a class diagram for these two entities each class should have at least three attributes and three operations.
- Show the relationship between the two classes highlighting type (decide on the type of relationship whether simple association, aggregation, or composition), multiplicity, and end names. Briefly state your reasons behind the choice of relationship.
- Develop an object diagram for at least a **Course** and three **Sections** showing the values of the data members.



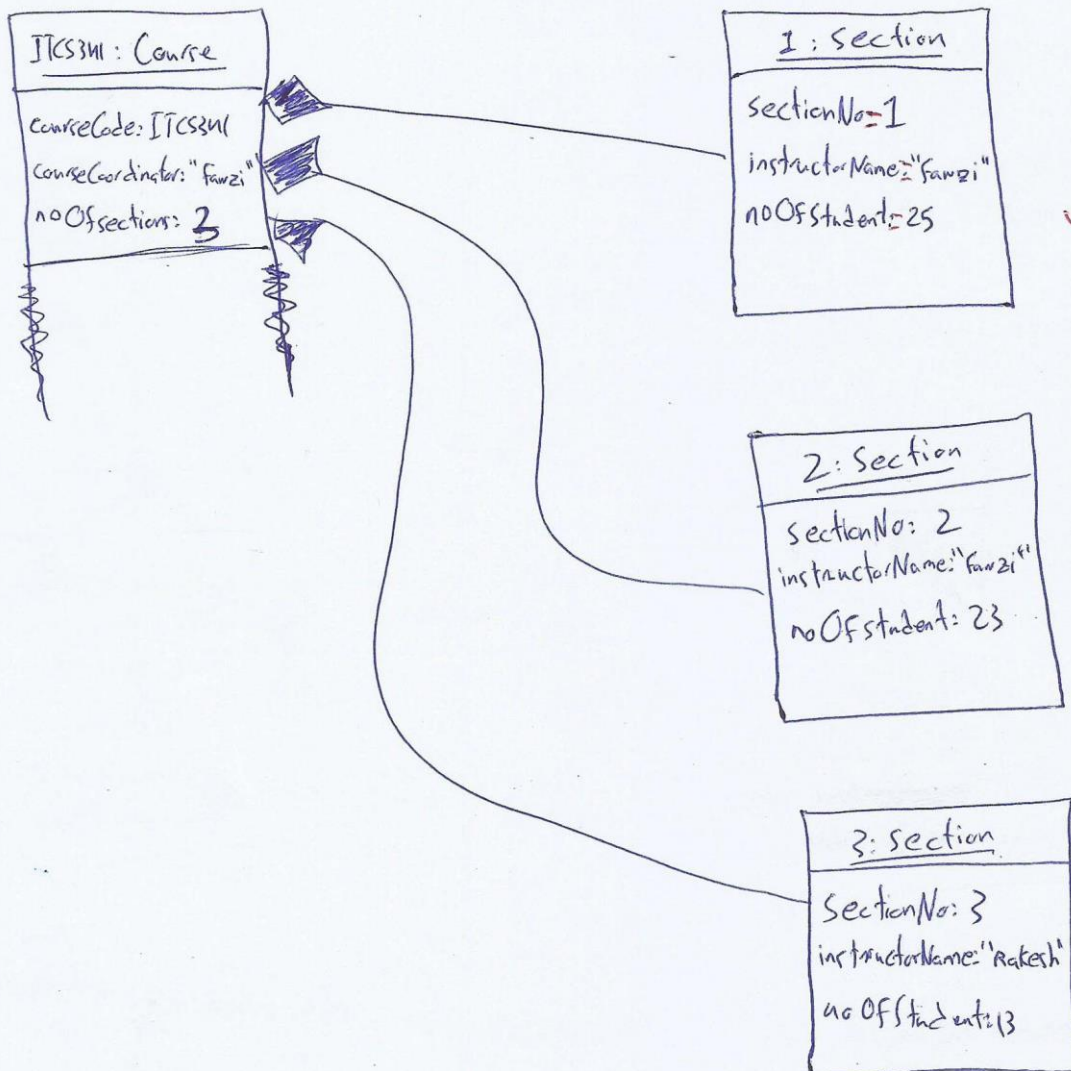
Composition, because a section cannot exist on its own, the section must ~~be~~ ~~from~~ belong to one section

if course is cancelled, all its sections are cancelled.

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Third Quiz

Students Name: _____

ID: _____

1) Briefly explain what is meant by the following:

- Multilevel inheritance
- Static Binding

(10)

2) A Faculty member is an Employee whom in return is a Person. Draw the UML diagrams to represent the classes and their relationships.

3) A Person would have a name and a place of residence (stored as a strings), and Employee would have a place of work (stored as a string), and a Faculty member would have an Academic discipline (i.e. IT, Arts, Business ... etc. stored as a string). Code suitable attribute(s) and a function or more in each of the classes to show how code could be reused in generalization (*without using polymorphism*). Briefly explain your answer.

1) Multilevel inheritance: when a class inherits from another class, and that class is also inherited from another class.



Static Binding: code execution in the same class which is called from. for example, if there is a function in a subclass, if the function gets called, the program will execute the function in that subclass.

Name: _____

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```
3) class Person {
    protected String name;
    protected String placeOfResidence;
    public void set setName(String n) {
        name = n;
    }
}
```

```
class Employee extends Person {
    protected String placeOfWork;
    protected double salary;
    protected double interests;
    public double calculateSalary() {
        return salary + interests;
    }
}
```

class Faculty extends Employee {

~~protected String academic;~~
protected String academic;
public String getAcademic() {
 return academic;
}

in class "Employee", we don't have to redefine the "setName" function.
also, in class "Faculty" we don't have to implement the function "calculateSalary" because it is already defined in its parent class, which is code reuse.

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Fourth Quiz

Students Name: _____

ID: _____

In a university registration system a student may **register** for a course that he wants to complete provided that he is a valid student. You are requested to document this Use Case using the following template.

Use Case: add a course (registration)



Summary: the system will allow students to register for courses, also they can drop or replace a course.

Actors: - students
- registration staff
- instructors

Preconditions: the system display available courses and seats for the students.

Description:

the students will open the system, then they will hit the registration button. the students will be able through this page to add a course, drop a course, and replace a course. the system will display all available courses which the student can take, along with the available seats. if there is enough seater, the the student can add this course.

Exceptions: students can't register above or below the credits limit (minimum 12 credits and maximum 19 credits)

Postconditions:

the system display available courses and seats for the students after it updates the database.



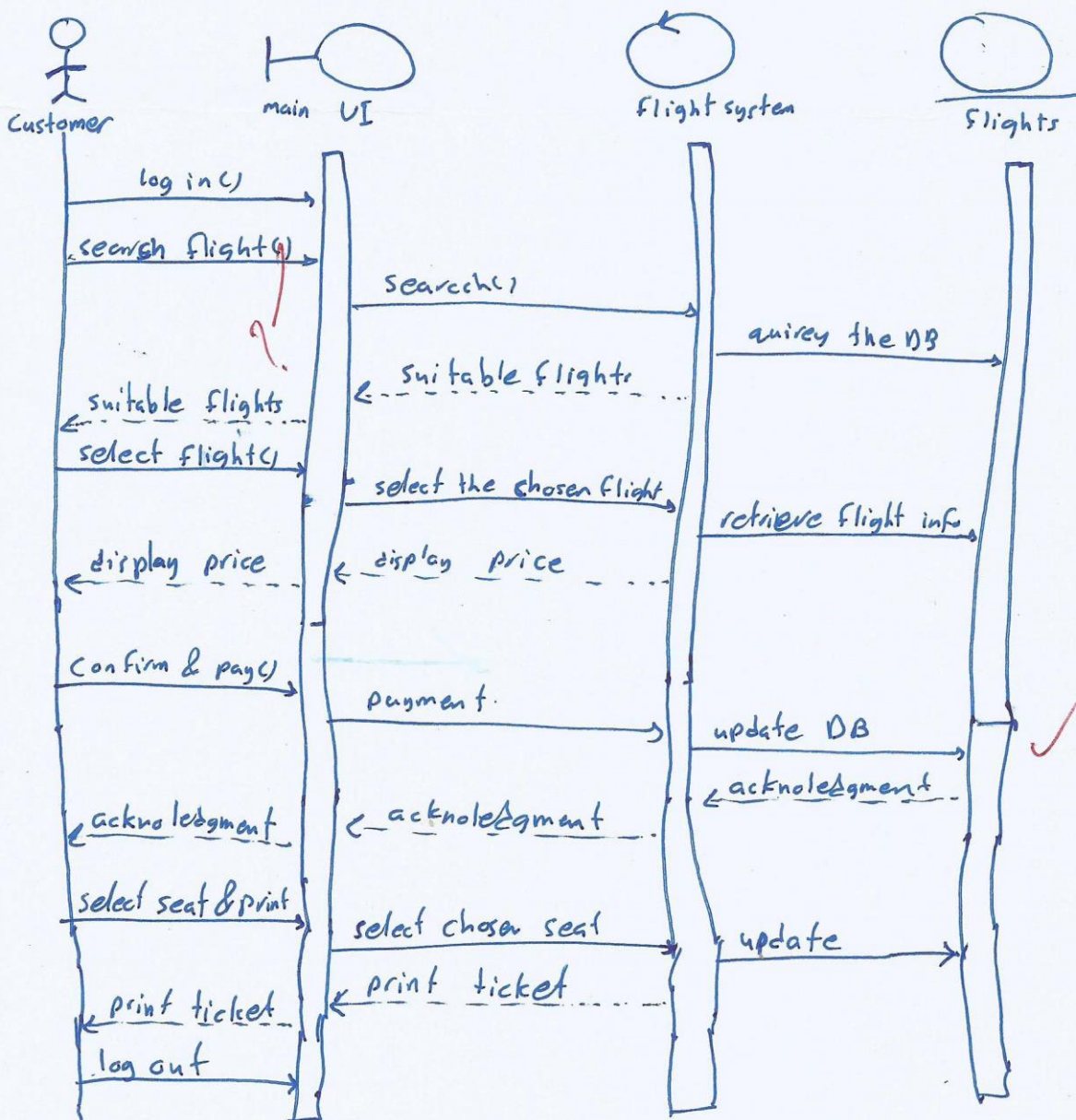
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ID: _____

Consider the following scenario for a **ticket purchase** use case from an online flight reservation system:

- The customer logs on.
- S/he searches for flight(s) based on travel dates and destination(s).
- The system searches for all suitable flight(s) and lists them for the customer.
- The customer selects his flight(s) to book and purchase.
- The system displays the selected flight(s) and presents the total price to be paid.
- The customer confirms the flight(s) and pays online.
- The customer selects seating location and prints boarding ticket.
- He then logs out from the system.

Draw a suitable sequence diagram for the above scenario classifying the objects into the three types, Boundary, Control, and Entity.



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Sixth-A Quiz

Students Name: _____

ID: _____ Sec: _____

Draw a suitable class diagram from the sequence diagram given below showing all possible attributes, operations, and relationships (at least an association and an aggregation).

